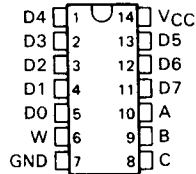


# SN54HC152, SN74HC152 8-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

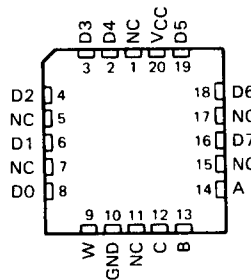
D2684, DECEMBER 1982—REVISED SEPTEMBER 1987

- Selects One-of-Eight Data Sources
- Performs Parallel-to-Serial Conversion
- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs
- Dependable Texas Instruments Quality and Reliability

SN54HC152 . . . J PACKAGE  
SN74HC152 . . . D OR N PACKAGE  
(TOP VIEW)



SN54HC152 . . . FK PACKAGE  
(TOP VIEW)



NC—No internal connection

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## description

These monolithic data selectors/multiplexers contain full on-chip binary decoding to select the desired one-of-eight data sources.

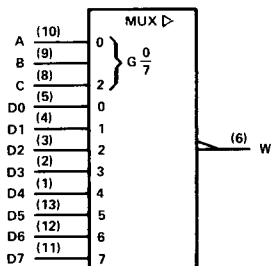
The SN54HC152 is characterized for operation over the full military temperature range of  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ . The SN74HC152 is characterized for operation from  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ .

FUNCTION TABLE

SELECT INPUTS			OUTPUT W
C	B	A	W
L	L	L	$\overline{\text{D0}}$
L	L	H	$\overline{\text{D1}}$
L	H	L	$\overline{\text{D2}}$
L	H	H	$\overline{\text{D3}}$
H	L	L	$\overline{\text{D4}}$
H	L	H	$\overline{\text{D5}}$
H	H	L	$\overline{\text{D6}}$
H	H	H	$\overline{\text{D7}}$

H = high level, L = low level

## logic symbol†



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

Pin numbers shown are for D, J, and N packages.

PRODUCTION DATA documents contain information current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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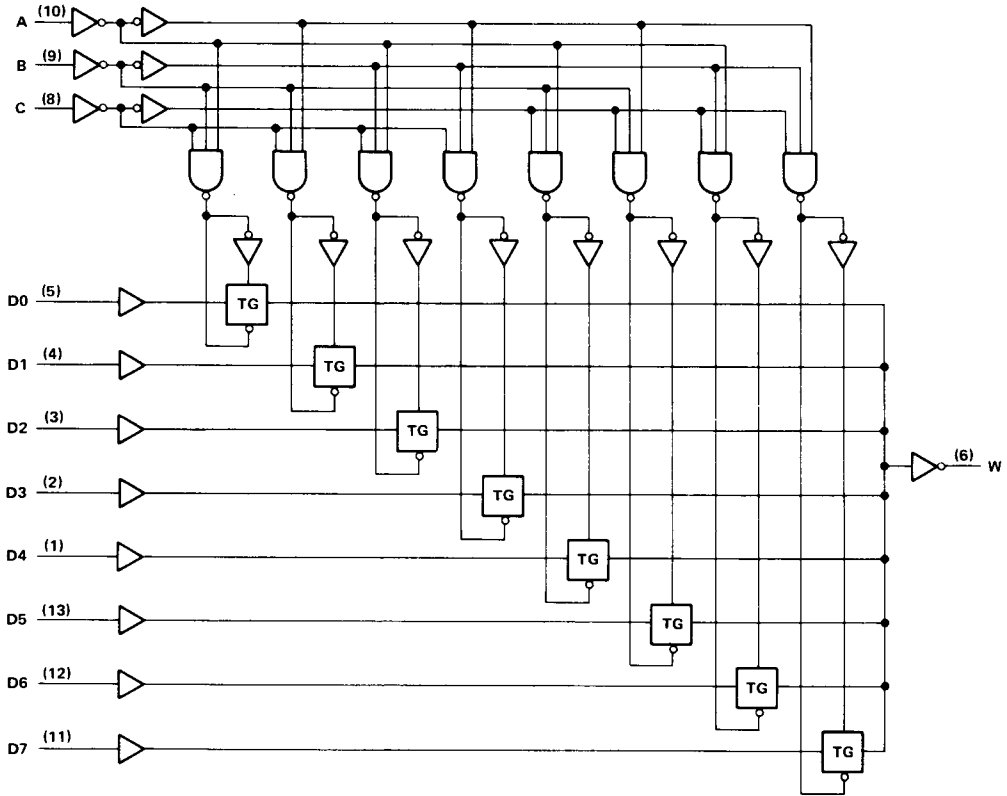
2-201

# SN54HC152, SN74HC152 8-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

logic diagram (positive logic)

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Pin numbers shown are for D, J, and N packages.

# SN54HC152, SN74HC152

## 8-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

### absolute maximum ratings over operating free-air temperature range†

Supply voltage, $V_{CC}$ .....	-0.5 V to 7 V
Input clamp current, $I_{IK}$ ( $V_I < 0$ or $V_I > V_{CC}$ ) .....	$\pm 20$ mA
Output clamp current, $I_{OK}$ ( $V_O < 0$ or $V_O > V_{CC}$ ) .....	$\pm 20$ mA
Continuous output current, $I_O$ ( $V_O = 0$ to $V_{CC}$ ) .....	$\pm 35$ mA
Continuous current through $V_{CC}$ or GND pins .....	$\pm 70$ mA
Lead temperature 1,6 mm (1/16 in) from case for 60 s: FK or J package .....	300°C
Lead temperature 1,6 mm (1/16 in) from case for 10 s: D or N package .....	260°C
Storage temperature range .....	-65°C to 150°C

† Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

### recommended operating conditions

		SN54HC152			SN74HC152			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
$V_{CC}$ Supply voltage		2	5	6	2	5	6	V
$V_{IH}$ High-level input voltage	$V_{CC} = 2$ V	1.5			1.5			V
	$V_{CC} = 4.5$ V	3.15			3.15			
	$V_{CC} = 6$ V	4.2			4.2			
$V_{IL}$ Low-level input voltage	$V_{CC} = 2$ V	0	0.3		0	0.3		V
	$V_{CC} = 4.5$ V	0	0.9		0	0.9		
	$V_{CC} = 6$ V	0	1.2		0	1.2		
$V_I$ Input voltage		0	$V_{CC}$		0	$V_{CC}$		V
$V_O$ Output voltage		0	$V_{CC}$		0	$V_{CC}$		V
$t_t$ Input transition (rise and fall) times	$V_{CC} = 2$ V	0	1000		0	1000		ns
	$V_{CC} = 4.5$ V	0	500		0	500		
	$V_{CC} = 6$ V	0	400		0	400		
$T_A$ Operating free-air temperature		-55	125		-40	85		°C

### electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS	$V_{CC}$	$T_A = 25^\circ\text{C}$			SN54HC152		SN74HC152		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
$V_{OH}$	$V_I = V_{IH}$ or $V_{IL}$ , $I_{OH} = -20 \mu\text{A}$	2 V	1.9	1.998		1.9		1.9	V	
		4.5 V	4.4	4.499		4.4		4.4		
		6 V	5.9	5.999		5.9		5.9		
	$V_I = V_{IH}$ or $V_{IL}$ , $I_{OH} = -6 \text{ mA}$	4.5 V	3.98	4.30		3.7		3.84		
		6 V	5.48	5.80		5.2		5.34		
$V_{OL}$	$V_I = V_{IH}$ or $V_{IL}$ , $I_{OL} = 20 \mu\text{A}$	2 V		0.002	0.1		0.1		V	
		4.5 V		0.001	0.1		0.1			
		6 V		0.001	0.1		0.1			
	$V_I = V_{IH}$ or $V_{IL}$ , $I_{OL} = 6 \text{ mA}$	4.5 V		0.17	0.26		0.4	0.33		
		6 V		0.15	0.26		0.4	0.33		
$I_I$	$V_I = V_{CC}$ or 0	6 V	$\pm 0.1$	$\pm 100$		$\pm 1000$		$\pm 1000$	nA	
$I_{CC}$	$V_I = V_{CC}$ or 0, $I_O = 0$	6 V		8		160		80	$\mu\text{A}$	
$C_i$		2 to 6 V		3	10		10		10	pF

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HCMOS Devices

**SN54HC152, SN74HC152**  
**8-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS**

switching characteristics over recommended operating free-air temperature range (unless otherwise noted),  $C_L = 50$  pF (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V <sub>CC</sub>	T <sub>A</sub> = 25°C			SN54HC152		SN74HC152		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>pd</sub>	A, B, or C	W	2 V	50	170		255		213	ns	
			4.5 V	18	34		51		43		
			6 V	16	29		43		36		
t <sub>pd</sub>	Any D	W	2 V	38	130		195		163	ns	
			4.5 V	14	26		39		33		
			6 V	12	22		33		28		
t <sub>t</sub>		W	2 V	20	60		90		75	ns	
			4.5 V	8	12		18		15		
			6 V	6	10		15		13		

C <sub>pd</sub>	Power dissipation capacitance	No load, T <sub>A</sub> = 25°C	70 pF typ
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switching characteristics over recommended operating free-air temperature range (unless otherwise noted),  $C_L = 150$  pF (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V <sub>CC</sub>	T <sub>A</sub> = 25°C			SN54HC152		SN74HC152		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>pd</sub>	A, B, or C	W	2 V		63	225		385		318	ns
			4.5 V		22	51		77		64	
			6 V		19	44		66		55	
t <sub>pd</sub>	Any D	W	2 V		52	215		325		268	ns
			4.5 V		18	43		65		54	
			6 V		16	37		55		47	
t <sub>t</sub>		W	2 V		45	210		315		265	ns
			4.5 V		17	42		63		53	
			6 V		13	36		53		45	

NOTE 1: Load circuit and voltage waveforms are shown in Section 1.

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